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THE EARLAINE POTATO, A NEW EARLY VARIETY

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United States Department of Agriculture, Bureau of Plant Industry, in cooperation with the Maine Agricultural Experiment Station

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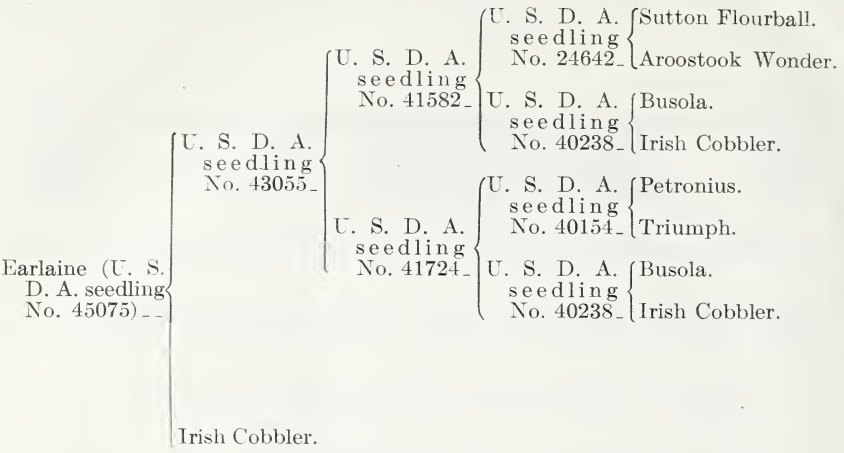
ORIGIN

Of the many varieties of cultivated potatoes now grown, only a small proportion are early maturing. During the last 2 centuries of potato culture in the United States a considerable number of early-maturing varieties have been produced; but because of low yield, susceptibility to diseases, and lack of adaptation, most of them have disappeared. It was to supplement those now grown with additional varieties free from some of their imperfections that the production of early-maturing varieties was included in the potato-breeding program of the United States Department of Agriculture.

The early phases of this work were handicapped by the almost complete pollen sterility of the available early varieties, which prevented their direct hybridization, thus making it necessary to depend upon late-maturing varieties that were fertile for pollen parents. As a result several generations of crossing were necessary before segregations, in which exceptional earliness was combined with other desirable characteristics, were obtained.

The Earlaine [1] potato was first grown in 1930 at Aroostook Farm, Presque Isle, Maine. It originated from a cross between Irish Cobbler and an unnamed seedling variety, No. 43055, the ancestry of which includes three early varieties, Irish Cobbler, Triumph, and U. S. D. A. seedling No. 24642. The complete pedigree of Earlaine follows.

[1] This name is derived from a contraction of the words "early" and "Maine."



DESCRIPTION

Plants medium in size, somewhat spreading; stems medium thick, prominently angled; nodes slightly swollen, green; internodes green; wings slightly waved or straight, green; stipules medium large, green, glabrous; leaves medium in length and width, midrib green, sparsely pubescent; primary leaflets light green, three pairs, oblong, large, mean length of blade 72.86 ± 0.57 [2] mm (2.87 inches), mean width 46.99 ± 0.38 mm (1.85 inches), index 64.76 ± 0.35;[3] leaflet petioles green; secondary leaflets medium in number, between pairs of primary leaflets; tertiary leaflets few; inflorescence much branched; leafy bracts none; peduncles medium in length, slightly pigmented, pubescent; pedicels medium in length, slightly pigmented, pubescent.

Flowers.—Calyx lobe tips medium in length, green, sparsely pubescent; corolla medium in size, white; anthers orange yellow; pollen abundant, good; style straight or slightly curved, stigma flattened globose, multilobed, green.

Tubers.—Roundish, thick, mean length 81.00 ± 0.37 mm (3.19 inches);[4] mean width 77.92 ± 0.27 mm (3.07 inches);[4] mean thickness 60.14 ± 0.29 mm (2.37 inches);[4] indexes, width to length 96.51 ± 0.61,[5] thickness to width 77.30 ± 0.47,[6] thickness to length 74.55 ± 0.61;[6] skin slightly flaked, self-colored, ivory yellow;[7] eyes medium shallow to shallow, same color as skin; eyebrows short, curved, medium prominent; flesh white; sprouts, color when developed in dark, creamy white; maturity very early.

CHARACTERISTICS

The Earlaine potato is a rapidly growing, early variety maturing at the same time as Irish Cobbler and Triumph when grown under the conditions prevailing in northern Maine.

The tubers are round, regular in outline, with medium shallow eyes and of an ivory-yellow color, classed as white by the commercial trade (fig. 1).

[2] Standard error.

[3] Calculated by dividing the width of each of 100 leaflets by their length and multiplying the average of these ratios by 100. The leaflets were taken from the fourth leaf from the top of the stem, one leaflet, the distal left lateral, being taken from each leaf. Since the potato leaflet is asymmetrical, the length was determined by taking the average of the measurements from the apex to the base of each respective lobe. This is a modification of the method described in the following work: SALAMAN, R. N. POTATO VARIETIES. 378 pp., illus. Cambridge. 1926. See pp. 163–170.

[4] Average of measurements of 100 tubers, each of a weight of approximately 8 ounces (223–233 g).

[5] Calculated by dividing the width of each 100 tubers by their length and multiplying the average of these ratios by 100. The data used for calculating the indexes were taken from the same measurements as those used to designate the dimensions of the tubers.

[6] Based on the measurements of the same tubers as those used for determining the width to length index, using the same methods of calculation.

[7] RIDGWAY, R. COLOR STANDARDS AND COLOR NOMENCLATURE. 43 pp., illus. Washington, D. C. 1912.

This variety is very highly resistant to mild mosaic under field conditions. In the mosaic-resistance test plots, where it was grown from 1935 to 1937 between rows of Green Mountain known to be infected with mild mosaic, a reading taken in 1937 showed no plants of Earlaine with symptoms of this disease, while 70 percent of the plants in the 11 check plots of healthy Green Mountain planted at intervals in the same experiment in 1936 had contracted the disease. In a shoot-graft exposure test, which is a very effective method for transmitting mild mosaic, symptoms of this disease were manifested as apical necrosis.

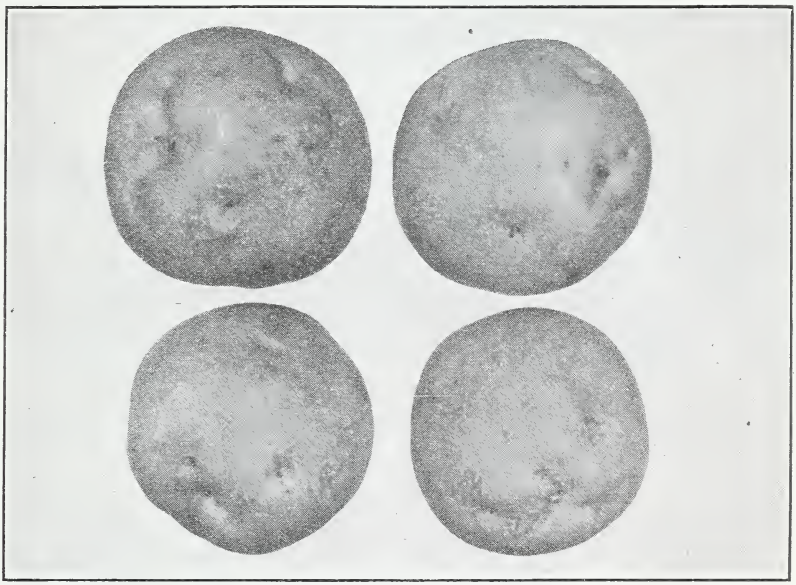


FIGURE 1.—Tubers of the Earlaine variety, showing desirable market quality.

The cooking quality of Earlaine ranks as fair, based on the average of the ratings of four seasons' tests of stock grown at Presque Isle.

Under storage conditions at Presque Isle, the keeping quality of the tubers is excellent.

This variety is of special value to the potato breeder because of the factors for earliness that it carries and the abundance of fertile pollen that it produces.

ADAPTATION AND COMPARISONS

The Earlaine has been given several tests to determine its adaptation to the environmental conditions that prevail in different sections of the country. The results of tests of this variety at Aroostook Farm, in comparison with the performance of two other early-maturing varieties, for a period of 5 years, are given in table 1.

TABLE 1.—*Yields, and percentage of tubers of U. S. No. 1 grade, of Earlaine and two other early varieties grown at Presque Isle, Maine, 1933–37*

Variety	Acre yield						Tubers grading U. S. No. 1
	1933	1934	1935	1936	1937	Mean,[1] 5 years	
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Percent*
Irish Cobbler	173	446	232	408	320	316	88.7
Warba	190	510	211	428	373	342	86.9
Earlaine	138	424	221	383	261	285	86.3

[1] Twice the standard error of a difference between means is 24 bushels.

If twice the standard error of a difference between means, 24 bushels, is taken as the limit of experimental variation, it will be seen that Earlaine was outyielded by both Irish Cobbler and Warba. Very good yields, however, have been obtained by the few commercial growers of Aroostook County, Maine, who have grown it for the last two or three seasons, and it is highly prized by them because of the attractive appearance of the crop.

During the season of 1937 Earlaine was grown in tests in 20 States besides Maine. The results of comparative tests conducted by E. V. Hardenburg, of Cornell University Agricultural Experiment Station, in different parts of the State of New York are given in table 2.

TABLE 2.—*Comparative yields of Irish Cobbler, Warba, and Earlaine in 10 counties in New York State in 1937*

Variety	Acre yield in counties indicated										
	Chemung	Clinton	Cortland	Cayuga	Oneida	Oswego	Schenectady	Suffolk	Tompkins	Wayne	Mean
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Irish Cobbler	125	400	305	257	173	463	69	182	204	378	256
Warba	128	533	288	191	206	425	62	256	209	430	273
Earlaine	41	458	353	273	119	468	59	170	166	393	250

Table 2 shows the relative adaptation of Earlaine in comparison with Irish Cobbler and Warba to the conditions that prevailed during the season of 1937 in the different counties in which the tests were conducted. Earlaine exceeded in yield, by 15 bushels or more, Irish Cobbler in 5 counties and Warba in 3 counties. If the standard error, calculated from the data in table 2, is taken into consideration, there is no significant difference between the means of the 3 varieties for the 10 tests. Definite conclusions cannot be drawn from 1 year's tests, but the data indicate that Earlaine is promising from the standpoint of yield in several districts of New York State.

Reports of tests in Rhode Island, South Carolina, Florida, Tennessee, and Kansas indicate that Earlaine is not adapted to conditions in those States.

In a report of the results of cooperative tests in eight localities in Colorado in 1937, C. H. Metzger, of the Colorado Agricultural Experiment Station, states:

> All growers were enthusiastic over the uniformity in size and type. In most places it was compared with Irish Cobbler and yielded about the same, but in three locations the yield was below that of Irish Cobbler. This seedling is very promising and should be named.

DISSEMINATION

The Department of Agriculture has no seed of this variety for general distribution. It is expected that the stock, which has been sent to the cooperating stations for tests, will be increased as rapidly as possible in the States where the variety is adapted.

SUMMARY

The Earlaine potato is believed to be a valuable addition to the small group of first-early varieties now grown.

The adaptation of this variety is somewhat limited, being confined chiefly to areas outside of the Southern and Midwestern States. It is a very promising variety in northern Maine and in certain counties of New York State, where it produces good crops of smooth tubers, uniform in size and attractive in appearance. These characteristics have also made it a very popular variety in several districts of Colorado, where it has been tested.

It is very highly resistant to mild mosaic under field conditions.

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